

R E M A R K S

Claim Amendments

The amendments to claims 2, 9, 18 and 45 of "the Mo is mixed in a grain boundary of Cu" is supported in the specification on page 8, lines 12 to 14 and page 30, lines 3 to 6.

The amendment to claims 9, 18 and 45 of "said metallic material has an electrical resistance higher than  $1.5 \mu \Omega \text{ cm}$  and lower than  $7.0 \mu \Omega \text{ cm}$ " is supported in the specification on page 11, lines 1 to 4.

Final Rejection

Claims 2, 9, 18 and 45 were rejected under 35 USC 103 as being unpatentable over USP 4,818,283 to Grunthaler et al.; Xiao et al., Scripta Metallurgica, Vol. 32, No. 3, pp. 353-358 (1995) or Chu et al., Journal of Applied Physics, Vol. 85, No. 9, 6462-6269 (1999) for the reasons set forth on pages 3 to 5 of the February 24, 2009 Office Action (Final Rejection).

Applicants' Presently Claimed Invention  
Patentably Distinguishes over the References

Chu et al. teach co-sputtering with separate Cu and Mo targets.

Xiao et al. teach a sputtering which is produced by attaching pieces of pure Cu foil to a Mo target (see page 353, lines 1 to 5 of Experimental Procedures). This means Xiao et al. teach a co-sputtering with separate Cu and Mo targets.

Chu et al. and Xiao et al. do not teach or suggest the feature of applicants' present claims that "the Mo is mixed in a grain boundary of the Cu."

Grunthaler et al. teach a process for producing a dispersion hardened copper alloy which includes admixing to a copper melt from 0.3 to 15 weight % Mo to provide a mixture which is a melt; and superheating the mixture to a temperature ranging from about 200°C to about 1000°C above the melting point of copper to provide a superheated melt (see the Abstract of Grunthaler et al.).

For the reasons discussed hereinbelow, Grunthaler et al. do not teach or suggest the feature of applicants' present claims that "the Mo is mixed in a grain boundary of the Cu."

An ingot of a copper alloy manufactured by a casting process, such as taught by Grunthaler et al., does not have the feature that Mo is mixed in a grain boundary of Cu. The reason for this assertion is as follows:

The difference between the melting point of Cu and the melting point of Mo is very great. The difference between the specific gravity of Cu and the specific gravity of Mo is very great. The difference between the atom density of Cu and the atom density of Mo is very great. A binary alloy including Cu and Mo is not a solid solution. Therefore, it is not possible that Mo could be mixed in a grain boundary of Cu in the Grunthaler et al. process.

Grunthaler et al., Chu et al. and Xiao et al. do not teach or suggest the feature that a metallic material has an electrical resistance higher than  $1.5 \mu \Omega \text{ cm}$  and lower than  $7.0 \mu \Omega \text{ cm}$ , as recited in applicants' present claims 9, 18 and 45.

Withdrawal of the 35 USC 103 rejection as set forth in the February 24, 2009 Office Action is respectfully requested.

Reconsideration is requested. Allowance is solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Richard S. Barth". The signature is fluid and cursive, with the first name "Richard" being more prominent than the last name "Barth".

Richard S. Barth  
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